

In the Claims:

1 (currently amended) A multiple beam RF device
comprising:

5 a housing having a central Z axis, said housing
enclosing a plurality of electron beam tunnels, each said
beam tunnel having a conductive inner surface, and each said
beam tunnel further comprising a sequence of drift tubes and
drift tube gaps, said beam tunnels arranged about said
10 central Z axis of said housing, and said housing including a
plurality of apertures, one said aperture for each said
electron beam tunnel;

 a plurality of electron guns equal to said plurality of
said electron beam tunnels, each said electron gun producing
15 an electron beam passing uniquely through a respective one
of said electron beam tunnels;

 a magnetic field applied to each said electron beam,
said magnetic field having a variation of less than 5% over
the extent of said electron beam tunnels;

20 each said electron gun having a respective cathode for
the generation of electrons, ~~an~~ a respective anode for the
acceleration of said electrons, and a respective focus
electrode for the focusing of said electron beams;

 a magnetic field corrector adjacent to each said
25 electron gun cathode for correcting said magnetic field such

Amendment for: Electron Gun for Multi-Beam Klystron by Ives et al. s/n 09/629,364

that said cathode surface has a magnetic field which is everywhere perpendicular to each said cathode surface.

2(original) The RF device of claim 1 wherein said beam
5 tunnels are arranged substantially parallel to said central Z axis.

3(previously amended) The RF device of claim 2 wherein at least one of said drift tube gaps includes a port for the
10 introduction of RF energy, and at least one of said drift tube gaps includes a port for the removal of RF energy.

4(original) The RF device of claim 3 wherein said housing is made from iron.

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5(original) The RF device of claim 1 wherein said magnetic field is sufficient to achieve confined electron flow.

20 6(previously amended) The RF device of claim 1 wherein said magnetic field produces a confining force which exceeds the space charge forces in each said electron beam.

7(original) The RF device of claim 6 where the
25 magnitude of said magnetic field is at least 2 times greater

Amendment for: Electron Gun for Multi-Beam Klystron by Ives et al. s/n 09/629,364

than said magnetic field required to balance said space charge force.

8 (currently amended) A multiple beam RF device

5 comprising:

a housing having a central Z axis and an R plane orthogonal to said Z axis, said housing enclosing a plurality of electron beam tunnels, each said beam tunnel having a conductive inner surface, and each said beam tunnel
10 further comprising a sequence of drift tubes and drift tube gaps, said beam tunnels arranged in said housing and parallel to said central axis Z of said housing, said drift tubes having a minimum separation distance from said central axis Z of value D;

15 a plurality of electron guns, each said electron gun having a respective cathode with a thermionic emitting surface for the generation of electrons, ~~an~~ a respective anode for the acceleration of said electrons, and a respective focus electrode for the focusing of said
20 electrons into an electron beam, each said electron beam passing through a corresponding one of said electron beam tunnels;

a magnetic field applied to each said electron beam,
said magnetic field having a field variation of less than 5%
over the extent of said electron beam tunnels;

one or more magnetic field correctors located ~~near~~
5 adjacent to said cathode and between said electron gun and
an electron beam entrance to a corresponding said beam
tunnel, said one or more magnetic field correctors modifying
said magnetic field such that said magnetic field is
perpendicular to each said cathode emitting surface.

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9(previously amended) The RF device of claim 8 wherein
said one or more magnetic field corrector comprises a single
coil located near at least one said electron gun cathode,
and said extent of said single coil is less than said
15 separation distance D.

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10(previously amended) The RF device of claim 8 wherein
said one or more field corrector comprises a single coil
located near at least one said electron gun cathode and said
20 extent of said coil is greater than said separation distance
D.

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11(previously amended) The RF device of claim 8 wherein
said one or more field corrector comprises a first coil with
25 an extent less than said separation distance D, and a second
Amendment for: Electron Gun for Multi-Beam Klystron by Ives et al. s/n 09/629,364

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coil with an extent greater than said separation distance D,
said first coil and said second coil located near at least
one said electron gun cathode.

5 12(previously amended) The RF device of claim 8 wherein
said one or more field corrector comprises a coil of
current-carrying wire which produces said correction field.

10 13(previously amended) The RF device of claim 8 wherein
said one or more field corrector comprises a permanent
magnet.

15 14(previously amended) The RF device of claim 8 wherein
said one or more field corrector comprises non-magnetized
iron.

20 15(currently amended) The RF device of claim 9 or 10
wherein said coil comprises a single coil of current-
carrying wire which produces said correction field.

16-20 (cancelled)

25 21(currently amended) The RF device of claim 8, wherein
said one or more field corrector is located on the central
axis of said device, said one or more field corrector has a

Amendment for: Electron Gun for Multi-Beam Klystron by Ives et al. s/n 09/629,364

near end in proximity to said housing and intersecting said central Z axis, and a far end opposite said near end, said one or more field corrector comprising a radially symmetric magnetic cylinder, said one or more field corrector having a
5 first radius on said near end, and a second radius on said far end which is larger than said first radius.

22(currently amended) The RF device of claim 21, said one or more field corrector further including an
10 electromagnetic coil on said ~~smaller~~ first radius.

23(previously amended) The RF device of claim 21 or 22, said one or more field corrector further including field correcting cutouts around said plurality of electron guns.
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24(currently amended) The RF device of claim 8 wherein said one or more field corrector provides a magnetic field such that equipotential flux lines formed by said magnetic field when modified by said one or more field corrector are
20 substantially parallel to said electron beam tunnels.

25(original) The RF device of claim 1 or 8 wherein said RF device is an oscillator.

26(original) The RF device of claim 1 or 8 wherein said RF device is an amplifier.

27 (currently amended) A magnetic circuit for
5 influencing the trajectories of a plurality of electron beams, said magnetic circuit comprising:

a cylindrical enclosure having a central axis and a first end cap having a plurality of apertures for the introduction of a plurality of electron beams and a second
10 end cap for the removal of said electron beams, each said beam starting from a respective thermionic cathode;

a main field generator producing a magnetic field perpendicular to said central axis;

a circularly symmetric flange located on said central
15 axis, said flange having a small diameter part for the disposition of a magnetic field generator and a large diameter part for introducing said field proximal to at least one of said cathodes;

additional magnetic field correctors influencing said
20 magnetic field adjacent to said cathodes, said magnetic field correctors located in an extent starting from said first end cap and extending in a direction opposite said second end cap.

25 28 (currently amended) The magnetic circuit of claim 27 where said magnetic field generator is a coil wound about said small diameter part.

Amendment for: Electron Gun for Multi-Beam Klystron by Ives et al. s/n 09/629,364

29 (previously added) The magnetic circuit of claim 27 where said magnetic field generator is a circular permanent magnet.

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30 (previously added) The magnetic circuit of claim 27 where said additional magnetic field correctors includes a supplemental circular field generator located on the outer surface of said first end cap, having a center on said central axis, and having a diameter sufficient to enclose said apertures on said first end cap inside said diameter of said supplemental field generator.

31 (previously added) The magnetic field generator of claim 30 where said supplemental field generator is an electromagnetic coil.

32 (previously added) The magnetic field generator of claim 30 where said supplemental field generator is a permanent magnet.

33 (previously amended) The magnetic field generator of claim 27 where said main field generator is an electromagnetic coil.

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34 (previously amended) The magnetic field generator of claim 27 where said main field generator is a permanent magnet.

5 35(previously presented) The RF device of claim 11 wherein said first coil comprises a coil of current-carrying wire which produces said correction field.

36(previously presented) The RF device of claim 11
10 wherein said second coil comprises a coil of current-carrying wire which produces said correction field.

37 (currently amended) A magnetic circuit for influencing the trajectories of a plurality of electron
15 beams, said magnetic circuit comprising:

a cylindrical enclosure having a central axis and a first end cap having a plurality of apertures for the introduction of a plurality of electron beams and a second end cap for the removal of said electron beams, each said
20 beam starting from a respective thermionic cathode;

a main field generator producing a magnetic field perpendicular to said central axis;

a circularly symmetric flange located on said central axis, said flange having a small diameter part for the
25 disposition of a magnetic field generator and a large

diameter part for introducing said field proximal to at least one of said cathodes.